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**Joint Polar Satellite System (JPSS)
Common Data Format Control Book –
External (CDFCB-X)
Volume IV Part IV
- Earth Radiation Budget and Space EDRs**

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JPSS Common Data Format Control Book - External Volume IV Part 4 - Earth Radiation Budget and Space EDRs

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Preface

This document is under JPSS Ground configuration control. Once this document is approved, JPSS approved changes are handled in accordance with Class I and Class II change control requirements as described in the JPSS Configuration Management Procedures, and changes to this document shall be made by complete revision.

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Change History Log

Revision	Effective Date	Description of Changes (Reference the CCR & CCB/ERB Approval Date; for first Block Version Release, identify origin of document source)	Pages Affected
Block/Rev 0122-	02/02/2012	<p>This version incorporates the following CCRs:</p> <p>474-CCR-11-0170 - Provides updates to the CDFCB-X Volumes III & IV Product Profile Tables and XMLs to both match each other and cleanup mistakes. The major changes are as follows:</p> <p>1) Table 5.6.4.2-2 - QF1_VIIRSSAEDR</p> <p>a. Input Wind Speed - Applies to Ocean Albedo changed to Input Wind Speed Source - Applies to Ocean Albedo based on Product Profile calls out Wind Speed Source, Values seem to relate more to a source than a unitless speed.</p> <p>This was approved by the JPSS Ground ERB on November 15, 2011.</p> <p>474-CCR-11-0284, including a new NASA cover page, as well as Block-specific revision identification and begins the transition of references from Raytheon “D” document numbering to the NASA “474” numbering system.</p> <p>PCR026128- Deleted Quality Flag 4 from VIIRS Surface Albedo EDR</p> <p>Baselined from the deployed version of 474-00001-04-04 Rev A.</p> <p>This was approved by the JPSS Ground ERB on February 2, 2012.</p>	<p>All</p> <p>Section 5.6.4.3</p>
Block/Rev 0122A	03/15/12	<p>This version incorporates 474-CCR-12-0344 (PCR026774) – correct VIIRS Surface Albedo EDR Product Profile – Quality Flag</p> <p>This was approved by the JPSS Ground ERB on March 15, 2012.</p>	Table 5.6.4.2-2

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Raytheon



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 Acquisition & Operations Contract

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**NPOESS Common Data Format Control Book - External
 Volume IV - Part IV - Earth Radiation Budget and Space EDRs**

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Revision/Change Record			For Document No. D34862-04-04
Revision	Document Date	Revision/Change Description	Pages Affected
---	10/21/2005	Incorporation of the following ECRs: ECR 446C provides the Revision --- (initial submission) of this document. The following ECRs are included in this revision: <ul style="list-style-type: none"> • D34659 CIS ICD ECR 216C - Initial "Draft" Release • D31400-10 SARSAT System OPSCON SYS-020-060 ECR 229B - Rev A • SY15-0007 System Specification ECR 274A - Active Fires classification to an ARP • D34659 CIS ICD ECR 290C - Rev A • D37005 NPP EDR-PR v1.8 ECR 431B - Requirements Updates • D34862-01 CDFCB-X Vol. I ECR 445B - Rev A • D34862-04-04 CDFCB-X Vol. IV Part 4 ECR 446C - Initial Release 	All
A	09/10/2007	Incorporation of the following DCOs and ECRs: ECR 617A provides the Revision A of this document. The following ECRs/DCOs are included in this revision: <ul style="list-style-type: none"> • ECR 515B, NPOESS Restructure Baseline • ECR 530C, Two Sensor EDRs • D34862-04-04 CDFCB-X Vol. IV Part 4 ECR 612A - VIIRS Land Surface Albedo EDR Update • ECR 617A CIDP CDFCB-X Vol. III and Vol. IV This revision also incorporates updates to the following: <ul style="list-style-type: none"> • Product Profile consistency updates 	All
B	07/07/2008	Incorporation of the following DCOs and ECRs: ECR 779A provides the Revision B of this document. The following ECRs/DCOs are included in this revision: <ul style="list-style-type: none"> • DCO B1 D34862-04-04 CDFCB-X Vol. IV Part 4 ECR 751A, Update of the VIIRS EDR PP XML 	All
C	01/23/2009	ECR 898B provides the Revision C of this document. No other ECRs/DCOs were incorporated into this Revision.	All
D	06/04/2009	ECR 959A provides Revision D of this document. No other ECRs/DCOs were incorporated into this Revision. Revision D for this document (CDFCB-X, Vol IV, Part 4) only, does not contain any content changes to the formats. This part is being updates to keep revision numbers in synch with the other 3 parts of the volume.	All



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E	12/09/2009	ECR 1014A incorporates the following changes: <ul style="list-style-type: none"> Added (N=Number of Granules) to Aggregate Dimension column in the Product Data Content Summary tables throughout the document based on user request for clarity as to what 'N' is Updated Surface Albedo QFs <ul style="list-style-type: none"> Corrected legend for Aerosol Bounce Added Input Data Quality Flag (used spare) Reference MIS in lieu of CMIS Updated XML Product Profile based on redlines to accompany document <ul style="list-style-type: none"> D34862-04-04_NPOESS-CDFCB-X-Vol-IV-Part-4_E_VIIRS-SA-EDR-PP.xml 	6, 8-10
F	04/16/2010	ECR 1061D incorporates the following updates: <ul style="list-style-type: none"> Removal of Availability Conditions throughout Updated valid RangeMin/Max values for scaled products to align with CDFCB-X Volume I <ul style="list-style-type: none"> VIIRS Surface Albedo EDR Updates to various quality flag descriptions, values, and Quality Summary metadata based on IPAC/Bubble testing results <ul style="list-style-type: none"> VIIRS Surface Albedo EDR Updated XML Product Profiles to match the redlines. Made Granule Size nomenclature consistent - 'Estimated Granule Size' throughout Updated Surface Albedo QF ordering - reflects that of NHF with verbiage specific to SA 	p. 5 p. 7 pp, 10, 13 p. 6 p. 8

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5.6 Earth Radiation Budget Environmental Data Records

For an overview of the CDFCB-X and the list of reference documents, see the JPSS CDFCB-X Vol. I . For an introduction to this volume, see the JPSS CDFCB-X Vol. IV Pt. 1 .

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5.6.4 VIIRS Surface Albedo

Data Mnemonic	EDRE-VRSA-C0030 (Official) EDRE-VRSA-C0031 (Substitute)
Description/ Purpose	<p>Surface Albedo is defined as the total amount of solar radiation in the 0.4 to 4.0 micron band that is reflected by the Earth's surface into an upward hemisphere (sky dome). This includes both diffuse and direct components, divided by the total amount incident from this hemisphere, again including both diffuse and direct components.</p> <p>The Surface Albedo EDR is required only during the daytime and under clear conditions. This is an instantaneous, not a time-averaged, measurement.</p> <p>The VIIRS Surface Albedo EDR consists of a single albedo field (with associated Quality Flags and scale/offset factors). The albedo is a combination of Land Surface Albedo (from the Land Surface Albedo IP), the Ocean Albedo (from the Net Heat Flux algorithm's Ocean Albedo IP), and the Ice Albedo (from the Snow Cover algorithm's Ice Albedo IP).</p> <p>Quality flags are passed through from the IP where they originated. Since the Surface Albedo product is a combination of Land, Ocean, and Ice Albedo IPs, the quality flags may apply to some or all of these. See the flag's product profile description for details.</p> <p>Sensors: VIIRS</p> <p>Effectivity: NPP and NPOESS</p>
File-Naming Construct	See the JPSS CDFCB-X Vol. I, , Section 3.0 for details.
File Size	<p>Estimated Granule Size: 11.72 MiB</p> <p>This granule size includes VIIRS Surface Albedo EDR related fields and quality flags only. Geolocation and metadata attributes are not included. Additional size added by HDF5 packaging is also not included.</p>
File Format Type	HDF5
Production Frequency	As per request

Data Content and Data Format	<p>See Section 5.6.4.1, VIIRS Surface Albedo EDR Data Content Summary</p> <p>See Section 5.6.4.2, VIIRS Surface Albedo EDR Product Profile</p> <p>See Section 5.6.4.3, VIIRS Surface Albedo EDR HDF5 Details</p> <p>See Section 5.6.4.4, VIIRS Surface Albedo EDR Metadata Details</p> <p>See Section 5.6.4.5, VIIRS Surface Albedo EDR Geolocation Details</p>
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5.6.4.1 VIIRS Surface Albedo EDR Data Content Summary

Table 5.6.4.1-1, VIIRS Surface Albedo EDR Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
Albedo	VIIRS Surface Albedo - Combined Albedo derived from the Land, Ocean and Ice Albedo IPs	unsigned 16-bit integer	[N*768, 3200]	[768, 3200]	unitless
QF1_VIIRSSAEDR	Pixel level Quality flags	unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF2_VIIRSSAEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
QF3_VIIRSSAEDR		unsigned 8-bit char	[N*768, 3200]	[768, 3200]	unitless
AlbedoFactors	Scale = First Array Element; Offset = 2nd Array Element	32-bit floating point	[N*2]	[2]	unitless

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5.6.4.2 VIIRS Surface Albedo EDR Product Profile**Table 5.6.4.2-1, VIIRS Surface Albedo EDR Product Profile**

Fields																													
Name	Data Size	Dimensions																											
Albedo	2byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size																							
		AlongTrack	Yes	No	768	768																							
		CrossTrack	No	No	3200	3200																							
		Datum																											
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries																	
		VIIRS Surface Albedo - Combined Albedo derived from the Land, Ocean and Ice Albedo IPs	0	-1.00	2.00	unitless	Yes	AlbedoFactors	unsigned 16-bit integer	<table><tr><th>Name</th><th>Value</th></tr><tr><td>NA_UINT16_FILL</td><td>65535</td></tr><tr><td>MISS_UINT16_FILL</td><td>65534</td></tr><tr><td>ONBOARD_PT_UINT16_FILL</td><td>65533</td></tr><tr><td>ONGROUND_PT_UINT16_FILL</td><td>65532</td></tr><tr><td>ERR_UINT16_FILL</td><td>65531</td></tr><tr><td>ELINT_UINT16_FILL</td><td>65530</td></tr><tr><td>VDNE_UINT16_FILL</td><td>65529</td></tr><tr><td>SOUB_UINT16_FILL</td><td>65528</td></tr></table>	Name	Value	NA_UINT16_FILL	65535	MISS_UINT16_FILL	65534	ONBOARD_PT_UINT16_FILL	65533	ONGROUND_PT_UINT16_FILL	65532	ERR_UINT16_FILL	65531	ELINT_UINT16_FILL	65530	VDNE_UINT16_FILL	65529	SOUB_UINT16_FILL	65528	<table><tr><th>Name</th><th>Value</th></tr></table>
Name	Value																												
NA_UINT16_FILL	65535																												
MISS_UINT16_FILL	65534																												
ONBOARD_PT_UINT16_FILL	65533																												
ONGROUND_PT_UINT16_FILL	65532																												
ERR_UINT16_FILL	65531																												
ELINT_UINT16_FILL	65530																												
VDNE_UINT16_FILL	65529																												
SOUB_UINT16_FILL	65528																												
Name	Value																												

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Table 5.6.4.2-2, VIIRS Surface Albedo EDR Product Profile - Quality Flags

Fields													
Name	Data Size	Dimensions											
QF1_VIIRSSAEDR	1byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size							
		AlongTrack	Yes	No	768	768							
		CrossTrack	No	No	3200	3200							
		Datum											
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries		
		Albedo Retrieval Quality (Indicates the quality of the pixel level retrieval) - Applies to Ice, Ocean, and Land Albedos	0			unitless	No		2 bit(s)	Name Value	Name	Value	
											Good	0	
											Poor (Exclusion)	1	
											No Retrieval	2	
		Out of Range - Retrieved albedo is out of expected reporting range of 0 <= Albedo <= 1. Applies to Ice, Ocean, and Land Albedos	2			unitless	No		1 bit(s)	Name Value	Name	Value	
											False	0	
											True	1	
		Stray light maximum radiance exclusion - Applies to Ice, Ocean, and Land Albedos	3			unitless	No		1 bit(s)	Name Value	Name	Value	
											False	0	
											True	1	
		Input Chlorophyll Concentration	4			unitless	No		1 bit(s)	Name Value	Name	Value	
											Available	0	
											Not Available (Climatology Used)	1	
		Input Wind Speed Source - Applies to Ocean Albedo	5			unitless	No		2 bit(s)	Name Value	Name	Value	
											Not available (ocean)/Not used (land/ice)	0	
											NWP	1	
											MIS	3	
		Spare	7			unitless	No		1 bit(s)	Name Value	Name Value		
		QF2_VIIRSSAEDR	1byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size					
AlongTrack	Yes			No	768	768							
CrossTrack	No			No	3200	3200							
Datum													
Description	Datum Offset			Unscaled Valid	Unscaled Valid	Measurement Units	Scaled	Scale Factor	Data Type	Fill Values	Legend Entries		

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Block 1.2.2

QF3_VIIRSSAEDR	1byte(s)	<table><tr><th>Name</th><th>Granule Boundary</th><th>Dynamic</th><th>Min Array Size</th><th>Max Array Size</th></tr><tr><td>AlongTrack</td><td>Yes</td><td>No</td><td>768</td><td>768</td></tr><tr><td>CrossTrack</td><td>No</td><td>No</td><td>3200</td><td>3200</td></tr></table>	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size	AlongTrack	Yes	No	768	768	CrossTrack	No	No	3200	3200										
		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size																					
		AlongTrack	Yes	No	768	768																					
		CrossTrack	No	No	3200	3200																					
		Datum																									
		Description		Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries															
		Aerosol Source (Indicates source of the 550nm aerosol information used in the retrieval) - Applies to Land, Ice, and Ocean Albedos. NAAPS or Climatology used in processing identified in EDR metadata	0				unitless	No		2 bit(s)	<table><tr><th>Name</th><th>Value</th></tr><tr><td></td><td></td></tr></table>	Name	Value			<table><tr><th>Name</th><th>Value</th></tr><tr><td>Direct VIIRS retrieval</td><td>0</td></tr><tr><td>Interpolation Only</td><td>1</td></tr><tr><td>Interpolation & Climatology / NAAPS</td><td>2</td></tr><tr><td>Climatology / NAAPS</td><td>3</td></tr></table>	Name	Value	Direct VIIRS retrieval	0	Interpolation Only	1	Interpolation & Climatology / NAAPS	2	Climatology / NAAPS	3	
		Name	Value																								
		Name	Value																								
		Direct VIIRS retrieval	0																								
		Interpolation Only	1																								
		Interpolation & Climatology / NAAPS	2																								
		Climatology / NAAPS	3																								
		Exclusion - AOT (at 550nm) > 1.0	2				unitless	No		1 bit(s)	<table><tr><th>Name</th><th>Value</th></tr><tr><td></td><td></td></tr></table>	Name	Value			<table><tr><th>Name</th><th>Value</th></tr><tr><td>False</td><td>0</td></tr><tr><td>True</td><td>1</td></tr></table>	Name	Value	False	0	True	1					
		Name	Value																								
		Name	Value																								
		False	0																								
		True	1																								
Coccolithophore degradation with calcite concentration due to coccolithophores >=0.3 mg/m ³	3				unitless	No		1 bit(s)	<table><tr><th>Name</th><th>Value</th></tr><tr><td></td><td></td></tr></table>	Name	Value			<table><tr><th>Name</th><th>Value</th></tr><tr><td>False</td><td>0</td></tr><tr><td>True</td><td>1</td></tr></table>	Name	Value	False	0	True	1							
Name	Value																										
Name	Value																										
False	0																										
True	1																										
Input Data Quality (Quality of Surface Albedo is degraded or not retrieved due to bad input data in horizontal cell) - Applies to Ice, Ocean and Land Albedos	4				unitless	No		2 bit(s)	<table><tr><th>Name</th><th>Value</th></tr><tr><td></td><td></td></tr></table>	Name	Value			<table><tr><th>Name</th><th>Value</th></tr><tr><td>Good</td><td>0</td></tr><tr><td>Degraded</td><td>1</td></tr><tr><td>No Retrieval</td><td>2</td></tr></table>	Name	Value	Good	0	Degraded	1	No Retrieval	2					
Name	Value																										
Name	Value																										
Good	0																										
Degraded	1																										
No Retrieval	2																										
Spare	6				unitless	No		2 bit(s)	<table><tr><th>Name</th><th>Value</th></tr><tr><td></td><td></td></tr></table>	Name	Value			<table><tr><th>Name</th><th>Value</th></tr><tr><td></td><td></td></tr></table>	Name	Value											
Name	Value																										
Name	Value																										

Block 1.2.2

Table 5.6.4.2-3, VIIRS Surface Albedo EDR Product Profile - Factors

Fields												
Name	Data Size	Dimensions										
AlbedoFactors	4byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size						
		Granule	Yes	No	2	2						
		Datum										
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries	
		Scale = First Array Element; Offset = 2nd Array Element	0			unitless	No		32-bit floating point	Name Value	Name Value	

5.6.4.3 VIIRS Surface Albedo EDR HDF5 Details

Figure 5.6.4.3-1, VIIRS Surface Albedo EDR UML Diagram, provides details on the contents and data types of the VIIRS Surface Albedo EDR product. This UML provides details at the product level detail only. In addition to this UML, refer to the JPSS CDFCB-X Vol. IV Pt. 1, Figure 1.2.1-1, Figure 1.2.1-1, Generalized UML Diagram for statically sized HDF5 IP/EDR Files, for a complete UML rendering of this product.

VIIRS-SA-EDR
+Albedo : H5T_NATIVE_UINT
+QF1_VIIRSSAEDR : H5T_NATIVE_UCHAR
+QF2_VIIRSSAEDR : H5T_NATIVE_UCHAR
+QF3_VIIRSSAEDR : H5T_NATIVE_UCHAR
+AlbedoFactors : H5T_NATIVE_FLOAT

Figure 5.6.4.3-1, VIIRS Surface Albedo EDR HDF5 UML Diagram

5.6.4.4 VIIRS Surface Albedo EDR HDF5 Metadata Details

The HDF5 metadata elements associated with the VIIRS Surface Albedo EDR are listed in the JPSS CDFCB-X Vol. V. The VIIRS Surface Albedo EDR metadata includes all of the common metadata at the root, product, aggregation, and granule levels.

In addition to the common metadata items for this product, Table 5.6.4.4-1, VIIRS Surface Albedo EDR N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level Metadata Values, provides the following items as name/value pairs. The listed name/value pair items in the table are the granule level quality flags for the VIIRS Surface Albedo EDR.

**Table 5.6.4.4-1, VIIRS Surface Albedo EDR
N_Quality_Summary_Name/N_Quality_Summary_Value Granule Level Metadata
Values**

N_Quality_Summary			
Name	Value	Description	Notes
Albedo Summary Quality	0 - 100	Percent of pixels within granule with high quality of retrieval	

N_Quality_Summary			
Name	Value	Description	Notes
Albedo Exclusion Summary	0 - 100	Percent of pixels within granule one or more exclusion criteria flags	
Summary Range Check	0 - 100	Percent of retrieved pixels outside of valid range	
No Ocean Coverage	0	At least one ocean pixel in granule	
	1	No ocean pixels in granule	
No Land Coverage	0	At least one land pixel in granule	
	1	No land pixels in granule	

5.6.4.5 VIIRS Surface Albedo EDR Geolocation Data Content Summary

VIIRS Surface Albedo EDR is produced on the VIIRS Moderate Resolution Geolocation with terrain correction applied. See the JPSS CDFCB-X Vol. IV Pt. 1 , Section 4.9.5, VIIRS Moderate Resolution - Terrain Corrected, for details.

5.6.5 DELETED

Block 1.2.2

5.7 Space Environmental Data Records

5.7.1 DELETED

Block 1.2.2

5.7.2 DELETED

Block 1.2.2

5.7.3 DELETED

Block 1.2.2

5.7.4 DELETED

Block 1.2.2

5.7.5 DELETED

Block 1.2.2

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Block 1.2.2

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Block 1.2.2

5.7.11 DELETED

Block 1.2.2

5.7.12 DELETED

Block 1.2.2

5.7.13 DELETED

Block 1.2.2